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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 10/807,103 | 03/24/2004 | Koichi Matsuda | 03500.017972. | 2515 |

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| EXAMINER | |
|---|---|
| MERSHON, JAYNE L | |
| ART UNIT | PAPER NUMBER |
| 1795 | |

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| 05/25/2010 | PAPER |

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 10/807,103 | MATSUDA ET AL. | |
| | Examiner | Art Unit | |
| | Jayne Mershon | 1795 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *30 April 2010*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *1-8,12 and 13* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *1-8* is/are allowed.

6)☒ Claim(s) *12 and 13* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

## DETAILED ACTION

### *Continued Examination Under 37 CFR 1.114*

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 3/23/2010 has been entered.

### *Status of Claims*

Claims 1-8, 12 and 13 are pending. Claims 9-11 and claims 14-17 have been canceled. Claims 1-8, 12 and 13 are examined below.

### *Response to Amendment*

Applicant's amendment submitted 4/30/3010 does not render the application allowable.

### *Status of the Rejections*

Rejection of claims 1-8 have been withdrawn in view of the amendment. Rejection of claims 12 and 13 have been maintained.

### *Claim Rejections - 35 USC § 112*

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

1. Claims 12 and 13 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Specifically, the limitation of the claim states two layers are stacked and the second layer is formed faster than the first layer. But the method of forming is not stated and

the order of forming is not stated, i.e. the second layer can be formed first and the first layer can be formed second since the only limitation is that the first layer is in contact with at least one interface. It is indefinite as to what the rate refers to, i.e. does it mean the rate is faster for a sol gel method, a spin coat method, an ion beam epitaxial method (see instant application paragraphs [0088] and [0095]). The rate could refer to the rate of drying, the rate of fusing, the rate of spraying, etc. Nowhere does it say the two layers must be formed by the same method.

### *Claim Rejections - 35 USC § 103*

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out

the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

1. Claims 12 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamashita et al. (JP 2003188401 A) in view of Kohiki et al. (US 6,787,069).

Regarding claims 12 and 13, Yamashita et al. teaches a stacked photovoltaic element comprising an intermediate layer between unit photovoltaic elements each having a pn-junction or a pin-junction (see paragraphs [002]-[003] and [0010]).

Furthermore, Yamashita et al. teaches stacking a first layer mainly composed of indium oxide, i.e. indium tin oxide (ITO), on at least one interface with the unit photovoltaic element (specifically the substrate side), and stacking a second layer mainly composed of zinc oxide on and in direct contact with the first layer of ITO (see paragraphs [0012]-[0013]).

Yamashita et al. does not disclose that the layer identified as the second layer (i.e. the zinc oxide layer) is formed at a rate higher than that of the first layer (claim 12).

Yamashita et al. does not disclose that the layer identified as the second layer (i.e. the zinc oxide layer) is formed at a lower temperature than that of the first layer (claim 13).

Kohiki et al. teach a physical and/or chemical method for depositing indium oxide that is at a slower deposition rate and higher temperature than the physical and/or chemical method used for depositing zinc oxide (see col. 7, lines 4-22 and col. 8, lines 10-42), i.e. the indium oxide layer is stirred 24 hours, dried and baked for one hour at 900C while the zinc oxide is sputtered without heating in less than 24 hours. The doping of the zinc oxide is carried out after

the high rate, low temperature deposition of the zinc oxide. The claim language allows virtually any type of layer forming, i.e. physical and chemical, and therefore can include methods where the layers can be subsequently transferred and/or fused.

Therefore, it would have been obvious to one of ordinary skill in the art to modify the layers of Stanbery by depositing the layers by known methods where the zinc oxide is deposited at a faster rate and lower temperature than the indium oxide because such techniques are well known and function to deposit the two layers.

### *Allowable Subject Matter*

Claims 1-8 are allowed.

As allowable subject matter has been indicated, applicant's reply must either comply with all formal requirements or specifically traverse each requirement not complied with. See 37 CFR 1.111(b) and MPEP § 707.07(a). Specifically, independent claims 12 and 13 must be cancelled or rewritten in an allowable form.

The following is a statement of reasons for the indication of allowable subject matter: Although graded ZnO films are known, graded ZnO films as an intermediate layer between stacked active layers is not known. Additionally, while there may be reasons to combine graded ZnO layers with known ZnO intermediate layers, there is no suggestion to grade the layer to be higher resistivity away from the anode.

### *Response to Arguments*

Applicant's arguments, see Remarks, page 7, filed 4/30/2010, with respect to claim 1 have been fully considered and are persuasive. The § 103(a) rejection of claims 1-8 have been withdrawn.

Applicant's arguments filed 4/30/2010, page 8, in regards to claim 12 and 13 have been fully considered but they are not persuasive.

The term physical and or chemical method as amended in claims 12 and 13 does not substantially define the method, since virtually any method would fall under a chemical or physical deposition. While applicant acknowledges any physical or chemical method can be used to form an indium oxide and zinc oxide layer (see applicant's specification [0081]), not all methods are applicable to different rates and temperature as disclosed by the applicant (see applicant's specification [0057]-[0068], in particular [0060] and reference to sputtering).

### *Conclusion*

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jayne Mershon whose telephone number is (571) 270-7869. The examiner can normally be reached on 9:00 AM to 5:00 PM; alt. Fridays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jennifer Michener can be reached on (571) 272-1424. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Jennifer K. Michener/
Supervisory Patent Examiner, Art Unit 1795

JLM
5/18/2010